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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,764	07/30/2003	Akira Aoto	10517/180	7701

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EXAMINER	
RUTHKOSKY, MARK	
ART UNIT	PAPER NUMBER
1745	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/629,764	AOTO, AKIRA	
	Examiner	Art Unit	
	Mark Ruthkosky	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/13/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meacher et al. (US 5,858,569) in view of Hiroshi et al. (JP 11-339,828) OR unpatentable over Hiroshi et al. (JP 11-339,828) in view of Meacher et al. (US 5,858,569) and further in view of Yoshimura et al. (US 6,291,094.)

The instant claims are to an apparatus comprising a separator for a fuel cell comprising a metal plate including a gas passage portion and a contact portion in a part other than the gas passage portion, the contact portion being located further to the side of a periphery of the metal plate than the gas passage portion, a conductive surface of the contact portion being exposed, and a terminal of a cell voltage monitor, wherein the exposed conductive surface of the contact portion contacts the terminal of a cell voltage monitor, and wherein an anti-corrosion surface treatment on the gas passage portion is different from an anti-corrosion surface treatment applied to the contact portion, the anti-corrosion surface treatment on the gas passage portion including a carbon coating.

Meacher et al. (US 5,858,569) teaches a separator for a fuel cell comprising a metal plate including a carbon coated gas passage portion and a peripheral foil contact portion in a part other than the gas passage portion, wherein the carbon-coated surface treatment applied to the gas passage portion is different from a surface treatment applied to the contact portion. The untreated frame/stainless steel section is a contact portion other than the gas passage portion and also may serve as an attachment portion (see col. 5, line 20- col. 6, line 13.) The individual fuel cells are electrically connected in the stack and clamped. A gasket frame portion is noted on the surface of the peripheral foil contact portion (cols. 5-6, figure 6.) The cells are connected with good electrical contact throughout the stack while insulating individual anode and cathode contacts of the stack (col. 1, line 40 to col. 2, line 4.) Meacher et al. (US 5,858,569) does not teach the contact portion being brought into contact with a terminal of a cell voltage monitor attached to the fuel cell.

Hiroshi et al. (JP 11-339, 828) teaches a fuel cell stack with a voltage-measuring terminal attached to the sidewall of the separator plate. The fuel cell separator plates have a protruding terminal integral with the separator for measuring the voltage of each cell in the fuel cell stack. The separator may be graphite, aluminum and stainless steel (paragraph 28.) The terminal is engaged with a voltage monitor (paragraphs 12-29.) The attachment portion is attached in the direction wherein a plurality of frames are stacked as taught in figure 1. Hiroshi et al. (JP 11-339,828) does not teach the metal separator plate is coated with a carbon layer in the area of gas flow along the separator plate.

It would be obvious to one of ordinary skill in the art at the time the invention was made to attach a terminal in the manner taught by Hiroshi et al. (JP 11-339,828) to the frame portion of

the separator plate of Meacher et al. (US 5,858,569) in order to measure the voltage of each cell in the fuel cell stack as taught by Hiroshi et al. (JP 11-339,828.) The attachment portion may be attached to the stainless steel frame by soldering or welding as taught by Hiroshi et al. (JP 11-339,828.) As the outer surface of the plate is not coated, it would be accessible to the exterior measuring device. Further, the skilled artesian would understand that the welding of the metal lead to the metal plate would provide a secure weld as compared with the carbon coating. Coating the attachment portion with a gasket will allow for the sealing of the fuel cells which prevents fuel, oxidant and water leakage from the fuel cell. The gasket serves as an anti-corrosion surface treatment on the peripheral foil portion.

Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to coat the gas flow portion of the separator plate taught by Hiroshi et al. (JP 11-339,828) with the carbon layer of material on of the separator plate of Meacher et al. (US 5,858,569) in order to flow gas through grooves and form an electrically conductive path for current generated in the groove regions of the cell to flow laterally to areas where the contacting portions of the separator plates. It would further be obvious to one of ordinary skill in the art at the time the invention was made to apply a conductive coating, such as graphite, to the stainless steel plate in order to allow for gas flow and electrical conduction. Hiroshi et al. (JP 11-339,828) teaches the plate may be of aluminum or stainless steel. For example, one of ordinary skill in the art would be motivated to coat the stainless steel plate with an aluminum coating as Hiroshi et al. (JP 11-339,828) teaches aluminum as a conductive separator material that forms a bond with a protruding terminal. Further, the contact faces between adjacent separators can be provided with

sufficiently high electronic conductivity and the internal resistance of the cell can be reduced to increase the output voltage of the fuel cell (as evidenced by US 6,291,094.)

With regard to claims 9-10, the references do not teach the entire gas passage is treated with a carbon coating. Yoshimura et al. (US 6,291,094), however, teaches a fuel cell comprising a grooved metal plate including a carbon coated gas passage portion and a contact portion in a part other than the gas passage portion, wherein the carbon-coated surface treatment is applied to the entire gas passage portion and is different from a surface treatment applied to the contact portion (see the claims, figures 4 and 8-11, and the corresponding text found in at least col. 6, lines 6-end and col. 7, line 30 to col. 8, line 65.) The separator includes a metal such as stainless steel, coated with a protective, conductive layer followed by a coating of carbon. The carbon may selectively added to the gas passage areas (see col. 14.) The frame/stainless steel section is a contact portion other than the gas passage portion and also serves as an attachment portion. The metal plate includes a gas passage area. It would be obvious to one of ordinary skill in the art at the time the invention was made to form the gas passage as part of the metal plate and coat the entire gas passage with carbon as taught in Yoshimura et al. (US 6,291,094.) The coatings will provide corrosion resistance and high conductivity for the transfer of electrons in a fuel cell (for example, see col. 7, lines 30-end.) Further, it would be obvious to one of ordinary skill in the art to include different anti-corrosion materials on the different surfaces of the separator plate in order to achieve desired properties of the plate. The references teach adding an anti-corrosion layer to prevent passivation of the separator (see Yoshimura, as noted), to give improved conductivity (graphite) and to promote sealing and conduction between fuel cell components. One of ordinary skill in the art would understand to add each of these materials to give the

desired effect taught in the reference. For example, adding graphite on the interior of the separator give improved conduction, as taught in Meacher, and using a polymer gasket on the edge surface of the plate seals the edges of the cell and protects the plate. The artesian would have found the claimed invention to be obvious in light of the teachings of the references.

Response to Arguments

Applicant's arguments, filed 12/6/2006, with respect to the amended claims have been fully considered, but are not persuasive.

Applicant argues that the references do not disclose or suggest "an anti-corrosion surface treatment on the gas passage portion is different from an anti-corrosion surface treatment on the contact portion, the anti-corrosion surface treatment on the gas passage portion including a carbon coating" as recited in claim 1., however, this is not accurate. Meacher teaches specific coatings of graphite, polymeric materials and gasket coatings. Graphite coats the gas passage area of the plate, while the gasket material coats the periphery of the plate. Applicant argues that the Meacher reference teaches porous graphite in narrow strips and then concludes that these materials are not effective in preventing corrosion. Applicant notes that the invention is to a carbon coating and that a coating is different than a strip. These arguments are not persuasive. A strip is a coating, as the strip coats the surface of the separator plate. Further, the strips will help prevent corrosion in the area that it covers. Claim 1 does not require the entire surface of the separator plate to be coated with a carbon material.

Further, the Yoshimura reference is cited for teaching an inexpensive and corrosion resistant metal-made gas separator. A metal plate is completely coated with a first coating layer

and a second coating layer of graphite. The coatings protect the plate by achieving a sufficiently high corrosion resistance (col. 7.) The resistance of the plate is improved by preventing the corrosion of material that forms a passivating layer. Yoshimura teaches a full coating of graphite on the separator plate and a grooved plate having gas passages as noted in the rejection. From this, it is quite clear that coating the plate will provide high corrosion resistance. It would be obvious to one of ordinary skill in the art at the time the invention was made to form the gas passage as part of the metal plate and coat the entire gas passage with carbon as taught in Yoshimura et al. (US 6,291,094.) The coatings will provide corrosion resistance and high conductivity for the transfer of electrons in a fuel cell (for example, see col. 7, lines 30-end.)

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

Mark Ruthkosky
Primary Patent Examiner
Art Unit 1745

2.12.2007